

Course Unit	Mathematics	Field of study	Mathematics
Bachelor in	Marketing	School	School of Public Management, Communication and Tourism
Academic Year	2022/2023	Year of study	1
Type	Semestral	Semester	1
Workload (hours)	162	Contact hours	T - 60 TP - 60 PL - TC - S - E - OT - O -
		Level	1-1
		ECTS credits	6.0
		Code	9205-714-1105-00-22

T - Lectures; TP - Lectures and problem-solving; PL - Problem-solving, project or laboratory; TC - Fieldwork; S - Seminar; E - Placement; OT - Tutorial; O - Other

Name(s) of lecturer(s) Claudia Maria Ferreira Sebastiao

### Learning outcomes and competences

At the end of the course unit the learner is expected to be able to:

1. Read, write and use mathematic language proficiently.
2. Manipulate mathematical expressions skillfully.
3. Apply functions to model and solve problems.
4. Recognize the meaning of formulas, interpret graphs in real context situations and be able to use them when solving problems.

### Prerequisites

Before the course unit the learner is expected to be able to:  
Apply K-9 Mathematics knowledges.

### Course contents

Real functions about a real variable. Exponential function. Logarithmic function. Limit and Continuity. Rate of Change and the Derivative of a Function. Matrix algebra.

### Course contents (extended version)

1. Matrix algebra
  - Definitions
  - Operations with matrices
  - Gaussian Elimination and rank of a matrix
  - Solving linear systems of equations
  - Determinants
  - Inverse of a regular matrix
2. Real functions about a real variable
  - Study of the characteristics of a function: analytical and graphical study
  - Roots, sign and monotony of a function
  - Absolute and relative extrema
  - injective function
  - Operations with functions
  - Linear, quadratic, exponential and logarithmic functions
3. Limit and Continuity
  - Limit a of a function
  - Some properties of limits
  - Limits and infinity
  - Continuity
4. Derivative of a function
  - Average rates of change
  - Definition of derivative of a function
  - Geometric interpretation of the derivative as a slope
  - The derivative function
  - Higher order derivatives
  - Applications of the derivative

### Recommended reading

1. Goldstein, L. (2005). Matemática Aplicada - Economia, Administração e Contabilidade (10.ª Ed.). Porto Alegre: Bookman. ISBN: 9788536305615.
2. Barroso, M., Sampaio, E., & Ramos, M. (2001). Exercícios de Métodos Quantitativos para Ciências Sociais. Lisboa: Edições Sílabo. ISBN: 9789726182627.
3. Tan, S. T. (2012). Applied Mathematics: for the managerial, life, and social sciences (6th Ed). Belmont: Brooks/Cole, Cengage Learning. ISBN: 9781133108948.

### Teaching and learning methods

Theoretical and practical classes with written documentation and explanation of the contents; presentation of examples; guided problem solving; students are motivated to participate in all debates concerning the above matters.

### Assessment methods

1. Distributed Evaluation - (Regular, Student Worker) (Final, Supplementary)
  - Practical Work - 20%
  - Intermediate Written Test - 40%
  - Final Written Exam - 40%
2. Distributed Evaluation - (Regular, Student Worker) (Final, Supplementary)
  - Intermediate Written Test - 50%
  - Final Written Exam - 50%
3. Evaluation by final exam - (Regular, Student Worker) (Final, Supplementary, Special)
  - Final Written Exam - 100%
4. Incoming and outgoing students - (Regular, Student Worker) (Final, Supplementary, Special)
  - Final Written Exam - 100%

## Language of instruction

Portuguese

## Electronic validation

Claudia Maria Ferreira Sebastiao	Luisa Margarida Barata Lopes	Elisabete da Anunciacao Paulo Morais	Luisa Margarida Barata Lopes
16-11-2022	21-11-2022	21-11-2022	21-11-2022